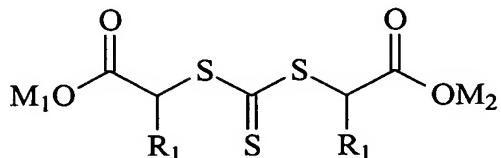


CLAIMS

1 – Compounds characterised in that they have a chemical structure in accordance with the following formula (I):



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- where R_1 designates an alkyl radical having 2 to 10 carbon atoms, an aromatic radical possibly substituted by an alkyl chain having 1 to 4 carbon atoms;
- and where M_1 and M_2 designate the hydrogen atom, an amine salt, ammonium or an alkaline cation, and are identical or different.

10

2 – Compounds according to claim 1, characterised in that the amines are chosen from among the aliphatic and/or cyclic primary, secondary or tertiary amines such as stearylamine, the ethanolamines (mono-, di-, triethanolamine), mono and diethylamine, cyclohexylamine, methylcyclohexylamine, amino methyl propanol and morpholine.

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3 – Compounds according to claim 1, characterised in that the alkaline cations are chosen from among sodium, potassium and lithium.

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4 – Compounds according to one of the claims 1 to 3, characterised in that R_1 is an alkyl radical having 2 to 6 carbon atoms, and M_1 and M_2 are identical and designate the hydrogen atom, sodium or potassium.

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5 – Compounds according to claim 4, characterised in that R_1 is an alkyl radical having 2 to 6 carbon atoms, and M_1 and M_2 are identical and designate the hydrogen atom or sodium.

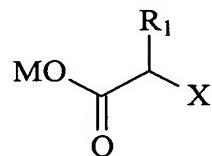
6 – Compounds according to claim 5, characterised in that R_1 is an alkyl radical having 2 to 4 carbon atoms, and M_1 and M_2 are identical and designate the hydrogen atom or sodium.

7 – Compounds according to claim 6, characterised in that R₁ is the alkyl radical having 4 carbon atoms, and M₁ and M₂ are identical and designate the hydrogen atom or sodium.

5 8 – Compounds according to claim 7, characterised in that R₁ is the alkyl radical having 4 carbon atoms, and M₁ and M₂ are identical and designate sodium.

9 – Process for manufacturing in water a compound of formula (I) characterised by:

10 a) Bringing into contact by pouring an aqueous solution of disodic trithiocarbonate Na₂CS₃ or an aqueous solution of dipotassic trithiocarbonate K₂CS₃ on a solution of a halogenated salt, which salt has a chemical structure in accordance with the following formula (II):



15 - where R₁ designates an alkyl radical having 2 to 10 carbon atoms, an aromatic radical possibly substituted by an alkyl chain having 1 to 4 carbon atoms;
 - where M designates ammonium or an alkaline cation;
 - where X designates a halogen.

20 b) and possibly a stage of acidification of the compound after stage a).

10 – A process according to claim 9, characterised in that the alkaline cations are chosen from among sodium, potassium and lithium.

25 11 – A process according to one of the claims 9 to 10, characterised in that R₁ is an alkyl radical having 2 to 6 carbon atoms, and M designates sodium or potassium.

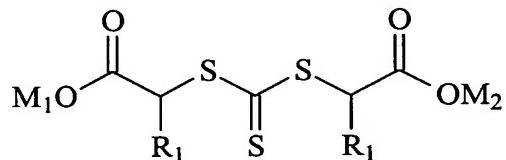
12 – A process according to claim 11, characterised in that R₁ is an alkyl radical having 2 to 4 carbon atoms, and M designates sodium or potassium.

13 – A process according to claim 12, characterised in that R₁ is the alkyl radical having 4 carbon atoms, and M designates sodium or potassium.

14 – A process according to claim 13, characterised in that R₁ is the alkyl radical having 4 carbon atoms, and M designates sodium.

15 – A process according to one of the claims 9 to 14, characterised in that X designates bromine.

10 16 – Use as transfer agents in a process of controlled radical polymerisation of the RAFT type, in water, of homopolymers of acrylic acid and/or copolymers of acrylic acid with other water-soluble monomers, of compounds characterised in that their chemical structure is in accordance with the following formula (I'):



15 - where R₁ designates an alkyl radical having 1 to 10 carbon atoms, an aromatic radical possibly substituted by an alkyl chain having 1 to 4 carbon atoms;
 - and where M₁ and M₂ designate the hydrogen atom, an amine salt, ammonium or an alkaline cation, and are identical or different.

20 17 – Use of compounds as transfer agents according to claim 16, characterised in that the amines are chosen from among the aliphatic and/or cyclic primary, secondary or tertiary amines such as stearylamine, the ethanolamines (mono-, di-, triethanolamine), mono and diethylamine, cyclohexylamine, methylcyclohexylamine, amino methyl propanol and morpholine.

25 18 – Use of compounds as transfer agents according to claim 16, characterised in that the alkaline cations are chosen from among sodium, potassium and lithium.

30 19 – Use of compounds as transfer agents according to one of the claims 16 to 18, characterised in that R₁ is an alkyl radical having 2 to 6 carbon atoms, and M₁ and M₂ are identical and designate the hydrogen atom, sodium or potassium.

- 20 – Use of compounds as transfer agents according to claim 19, characterised in that R₁ is an alkyl radical having 2 to 6 carbon atoms, and M₁ and M₂ are identical and designate the hydrogen atom or sodium.
- 5 21 – Use of compounds as transfer agents according to claim 20, characterised in that R₁ is an alkyl radical having 2 to 4 carbon atoms, and M₁ and M₂ are identical and designate the hydrogen atom or sodium.
- 10 22 – Use of compounds as transfer agents according to claim 21, characterised in that R₁ is the alkyl radical having 4 carbon atoms, and M₁ and M₂ are identical and designate the hydrogen atom or sodium.
- 15 23 – Use of compounds as transfer agents according to claim 22, characterised in that R₁ is the alkyl radical having 4 carbon atoms, and M₁ and M₂ are identical and designate sodium.
- 20 24 - Use of compounds as transfer agents in a process for controlled radical polymerisation of the RAFT type, in water, of homopolymers of acrylic acid, according to one of the claims 16 to 23, characterised in that the said process is accomplished in a continuous manner, in a batch or semi-batch manner.
- 25 25 - Use of compounds as transfer agents in a process for controlled radical polymerisation of the RAFT type, in water, of homopolymers of acrylic acid, according to claim 24, characterised in that the said process is accomplished in a batch or semi-batch manner.
- 30 26 – Use of compounds as transfer agents in a process for controlled radical polymerisation of the RAFT type, in water, of copolymers of acrylic acid with other water-soluble monomers, according to one of the claims 16 to 23, characterised in that the said process is accomplished in a continuous manner, in a batch or semi-batch manner.

SUMMARY

The invention concerns new sulphurous compounds, their manufacture by a process in aqueous media, their use as transfer agents in a process of controlled radical polymerisation in water of acrylic acid and/or of acrylic acid with water-soluble monomers. It concerns also the polymers obtained and their uses as dispersing agents or grinding aid and/or co-grinding aid agents of mineral matter in aqueous suspensions, and as dispersing agents incorporated directly in aqueous formulations containing mineral matters. Finally, the invention concerns the formulations of mineral matter thus obtained .